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The "Chronic Nicotine State" and Anxiety: A Behavioral and Electroencephalographic Analysis of Induced and Spontaneous Hyper-activation in Rats.

The current project represents a continuation of a line of research. The investigators' electrophysiological and behavioral evidence to date indicates that chronic nicotine treatment produces shifts in the balance between reticular formation (RF) and limbic influences on arousal, resulting in a state of enhanced "motivational (limbic) arousal" and reduced "drive (reticular) arousal." Recent data suggest that nicotine can protect from the disruption of electrically-induced RF overdrive. The present study is aimed at determining whether chronic nicotine will ameliorate the behavioral disruption resulting from spontaneous states of RF overactivation (possibly, analogous to anxiety states).

It is possible to separate more highly emotional or anxious animals from low anxiety animals by behavioral measures. Further, it has been shown that high and low emotionality strains of rats will respond differentially to various psycho-active drugs. The investigators propose to test the relative effectiveness of nicotine's protection from stress-induced behavioral disruption in rats with constitutionally different spontaneous arousal levels and to characterize the cortical and subcortical electroencephalographic indices of their functional states.

These researchers propose to examine the consequences of chronic nicotine and withdrawal in rats separated into low anxiety and high anxiety or emotionality categories on the basis of base-line behavioral measures. If rats classified as highly anxious are in that state because of relative RF predominance in the modulation of arousal, then chronic nicotine treatment should render them less sensitive to stress; i.e., they should be less susceptible to behavioral breakdown in anxiety-provoking situations than are highly anxious rats not treated with nicotine.

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